SUPPORTS COURSES
F15EBQ
F15ETX
F15ESOC

ACADEMIC STUDENT WORKBOOK
F-15E

AVIONICS
AVI-9
DIGITAL MAP SYSTEM/TACTICAL SITUATION DISPLAY (DMS/TSD)

FEBRUARY 1999

(SUITE 3 OFP)

AIR COMBAT COMMAND

ADMINISTRATIVE INFORMATION

This student workbook is designed to provide information on the F-15E, its systems and capabilities. It is not a sole source document, but is to be used in conjunction with other standard Air Force publications and technical manuals. If you find any differences between the material contained herein and other governing regulations, adhere to the regulations and notify the OPDR.

Changes to this workbook are indicated with a heavy black line in the left margin.

Forward recommendations for revision or change to 4 TS, SJAFB, NC, 27531.

_____

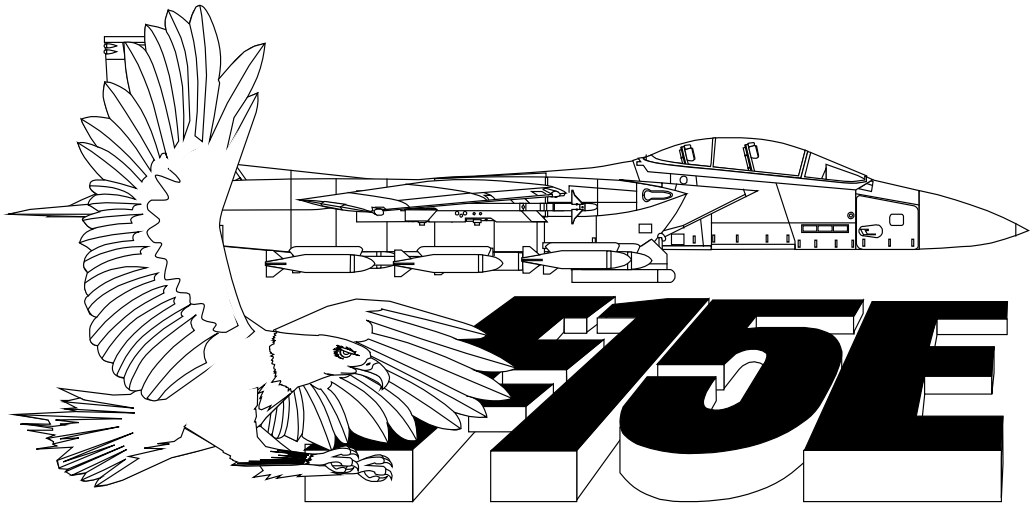
Supersedes: AVI-9, July, 1998

OPDR: 4 TS

Index of Changes

Change #	Effective Date	Pages Affected

AVIONICS



COVER

DIGITAL MAP SYSTEM/TACTICAL SITUATION DISPLAY (DMS/TSD)

INTRODUCTION

This workbook is your guide in studying the F-15E digital map system/tactical situation display (DMS/TSD). It familiarizes you with the components, nomenclature and operational characteristics of the DMS/TSD.

CONTENTS:

INTRODUCTION.....A-1

CRITERION REFERENCED OBJECTIVES (CROs).....B-1

STUDENT PREPARATION REQUIREMENTS C-1

TEXT.....D-1

END OF TEXT QUIZ.....N/A

GLOSSARY.....F-1

CRITERION REFERENCED OBJECTIVES (CROs)

1. Identify the function and basic operating characteristics of the TSD.
2. Interpret a TSD.
3. Identify the function of the TSD controls.
4. Identify TSD limitations and interfaces.
5. Given a TSD, interpret the advisories displayed.

REFERENCES

TO 1F-15E-1	Section I	Tactical Situation Display (TSD)

STUDENT PREPARATION REQUIREMENTS

BEFORE THE CBT LESSON

1. Study the information contained in this workbook.

2. Read the referenced material in TO 1F-15E-1.

(This Page Intentionally Blank)

TEXT

COMPONENTS AND CONTROLS

The Tactical Situation Display (TSD) is a presentation of your aircraft position in relation to a planned mission route, which has been superimposed over a moving map format. Its primary function is to display the planned navigation information. However, it also provides sensor positioning/control information to the crew.

The TSD is composed of an MPD/MPCD display; hands on controls (throttles/stick/controllers), commonly referred as HOTAS controls; and a remote map reader (RMR) for the color moving map reproduced on 35mm film strips. In the future, the RMR will be replaced by the digital map system.

Multipurpose Display/Multipurpose Color Display (MPD/MPCD)

The TSD is selected by pressing PB #5 on the Menu 1 display (Figure D-1) and is presented on either the MPD or the MPCD. Whether a color display or monochromatic display is used is dependent on both the situation and personal preference. At night the MPCD display can be too bright, so some crew members put the TSD display on an MPD. Other considerations for TSD placement include proximity to other displays such as A/G radar or TF E-scope, type of mission and phase of flight. The bottom line is that optimum TSD placement is dependent on a variety of factors.

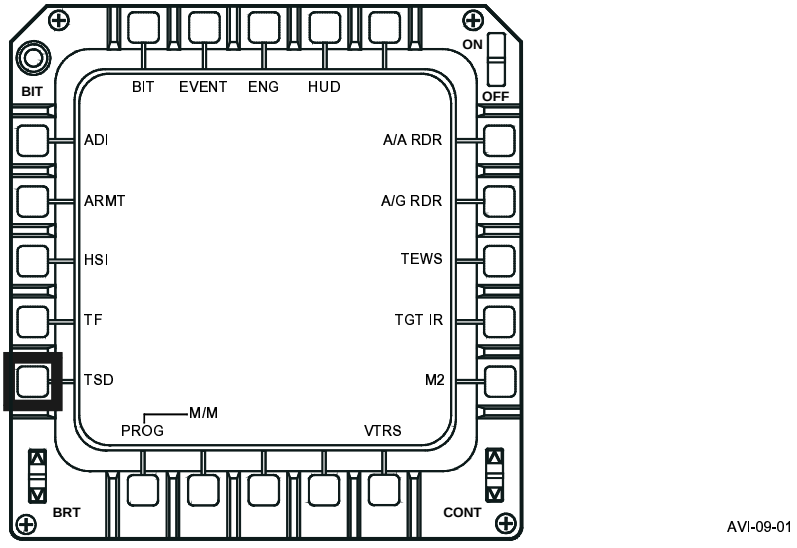


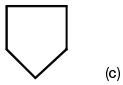
Figure D - 1. MPD Menu 1 Display.

Symbology

There are several navigation symbols displayed on the TSD. Their positions relative to the aircraft symbol and the moving map are INS or MN determined depending on the present position keeping source. The term "sequence points" is used in describing the F-15E navigation symbols. This term is used to define a set of geographical points that can be overflown or used for sensor cueing. The following is a discussion of sequence points and symbology.

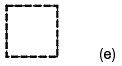
(a) Steer points are defined geographical points that comprise the route to be flown. They are labeled with whole numbers. Steer point circles are all the same size. The circular symbol is also used to denote avoid or no-fly areas on the TSD. The avoidance rings are variable in size according to radius data for each ring loaded by DTM or at PB #9 on the point data submenu. Radii may be .9 to 99.9 nm. Avoidance rings will have the appropriate avoidance point number in the center to show the center of the ring. Avoidance points are preceded by an "A" prefix. Fifteen avoidance point rings may be loaded per route. Five avoidance points/rings may be displayed at any one time on the TSD.

(b) Aim points are associated with steer points. They are sensor significant points used for off route sensor cueing and position updates. They are labeled with a steer point number and one decimal place (e.g., 1.1). Each steer point can have up to seven associated aim points.



(c) Base steer point location.

(d) The point prior to a target point is an initial point (IP). IPs follow the steer point numbering system.

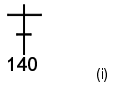


(e) Aim points associated with IPs are shown as segmented squares. They follow the same numbering system as aim points associated with steer points.

(f) Target points are labeled by a whole number followed by a decimal point (e.g., 8. also referred to as target syntax).

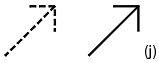
(g) Target offset points are sensor significant points associated with target points. They are labeled with a target point number and a decimal number in hundredths (e.g., 8.01). Each target can be assigned up to seven different offset points.

(h) Bullseye (BE) points are used as reference points for bullseye bearing and range. They may be route dependent or route independent. There is no number next to the symbol to indicate which bullseye point is being used.

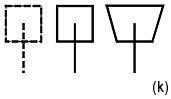


(i) Aircraft present position with magnetic ground track readout. Current aircraft position is the top intersection of lines (wingline).

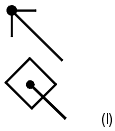
AVI-09-02



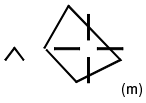
Targeting IR cue (arrowhead) on the end of a range and bearing line from the aircraft symbol to its selected position. The broken line indicates you are not in command of the TSD.



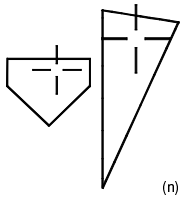
Air-to-ground (A/G) radar high resolution map (HRM) patch map cue on the end of a range and bearing line. The box appears square or trapezoidal depending on display window (DW) size (1.3, 3.3, 4.7, or 10 nm) and range. The DW size corresponds to the size of the HRM patch map that would result if commanded (e.g., 10 would represent a patch map 10 nm square). The broken line indicates not in command.



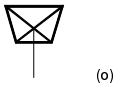
When the targeting IR cue or HRM radar cue has a dot attached to it, that ground position is being point tracked and the cue is stabilized to that set of coordinates. This function is available even when the aircraft is not equipped with a targeting IR pod. When a hand-off is commanded (by HOTAS action), the targeting IR will point at the area indicated by the sensor cue symbol or the radar will make a patch map of the area enclosed within the display window. Hand-off can be commanded with or without point tracking.



The IR or HRM radar cue without the range and bearing line indicates the targeting IR active LOS or the HRM radar active footprint (patch mapping position). The active LOS of the sensors may or may not be the same as that of the range and bearing line (RBL), depending on whether or not they have been commanded (by switch action) to the RBL cue.

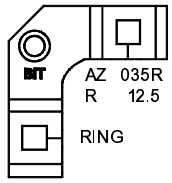


This symbol indicates the active RBM radar search pattern and A/G radar cursor position. The symbol represents the A/G radar cursor. There is a wide pattern for a full scan and a narrower pattern for a partial scan.



The HRM cue DW with an "X" in it indicates that the cue is outside the range and/or azimuth capability of the radar for making patch maps, or that a DW size/range incompatibility exists (the radar will not make a patch map of the selected size because that geographical area is too close or too far relative to aircraft present position). That area is within 8° of the velocity vector, inside the minimum/outside the maximum range for selected display window size, or outside the radar gimbal limits (60°).

This symbol indicates a mark point, identified with a whole number above it. Mark points are loaded by either performing an overfly mark via the UFC, a radar mark via the A/G radar display, a target IR mark, or an automatic overfly mark when the weapon release button is depressed, for an unplanned target. Up to 10 mark points may be displayed on the TSD.



An azimuth and range readout of the HRM radar cue or targeting IR cue is displayed in the upper left corner. The active LOS of the HRM or the targeting IR will correspond to the displayed AZ/Rng only if the sensor has been commanded (through HOTAS action) to the corresponding cue.

AVI-09-03

Introduction to the Display

Figure D-2 shows a very small portion of preplanned route A, target 8.A and offset point 8.01A. Annotated on the diagram are several of the symbols that you may see while using the TSD. More symbols are shown in other figures. The route is entered either manually through the UFC point data submenu or via the DTM. The range markers, both along track and cross track, simply provide the user with visual cues to judge the distance relationship between map geographic points and the aircraft present position.

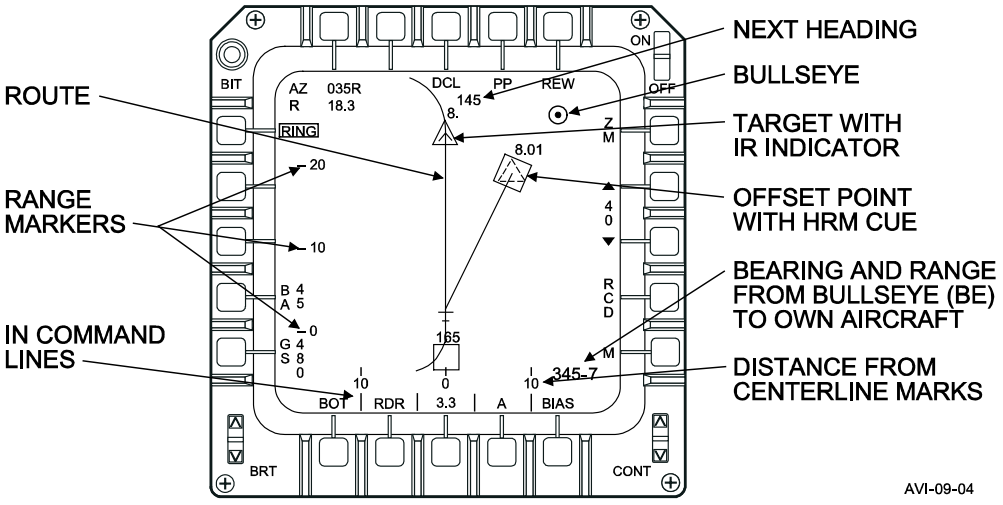


Figure D - 2. Sample Map.

The groundspeed (GS) and bank angle (BA) selections at PB #5 and PB #4, respectively, allow computation and display of a route course line adjusted for planned aircraft turn radius. GS selections are 0, 420, 450, 480, 510, 540, 570 and 600. If 0 is selected, turn radius is not displayed (i.e., the route turn points are connected by straight lines). Any BA and GS selection other than zero provides the appropriate turn radii and magnetic ground track from point to point. The groundspeed and bank angle options are only available when the route at PB #9 matches the route at PB #10 on the UFC Menu 1 or Data 1 display (e.g. current aircraft route). BA is selectable on all TSD scales and is used to make calculations such as ETA/ETE. BA selections are 30°, 45° and 60°.

Display Controls

In order to use the TSD controls and HOTAS, you must be in command of the display (Figure D-3). A "SYSTEM IN USE" cue is displayed if a crew member attempts to take command while the other is slewing a sensor cue or commanding a sensor to the cue position (all through HOTAS action).

PB #1 causes avoidance point rings to be displayed or removed from the TSD. RING is boxed when selected and the rings are displayed. The avoidance points are automatically displayed (regardless of whether RING is boxed or unboxed) if loaded for the route. Button numbers 2-3 have no control function on this display.

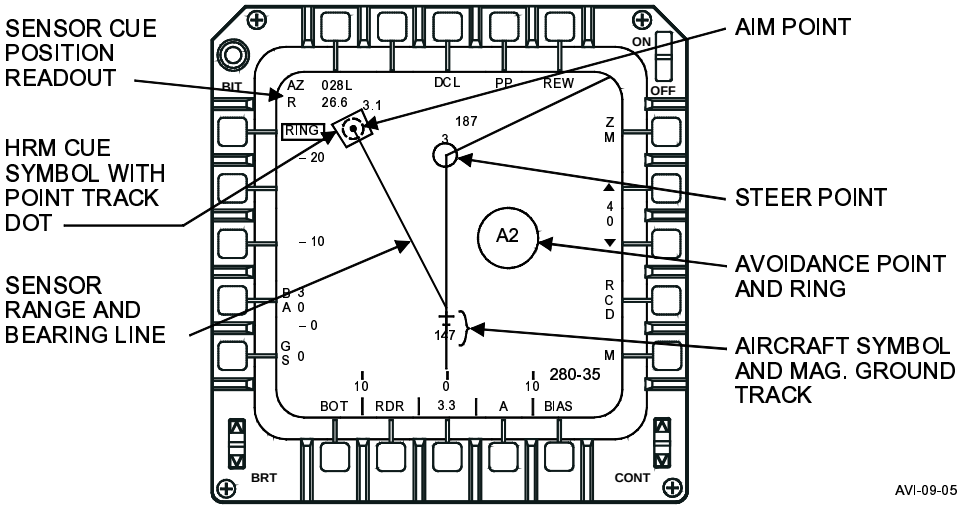


Figure D - 3. Display Controls.

BOT/CTR: Pressing PB #6 changes the aircraft position on the TSD. With CTR selected, the aircraft symbol is positioned in the middle of the display. BOT displays 75% of the selected range in front of the aircraft. The maximum range that can be displayed in front of the aircraft is 60 nm, using an 80 nm display with BOT selected. The maximum range that can be displayed behind the aircraft is 40 nm, on an 80 nm display with CTR selected.

RDR/FLIR: PB #7 selects the sensor for cueing, either A/G radar or targeting IR. When either one is selected, its corresponding cue symbol is displayed at the end of the range and bearing line. The range and bearing line is controlled by the TDC. The sensor cue position (azimuth and range) is displayed in the upper left corner of the display.

The term FLIR (forward looking infrared) can be confusing as it is occasionally used interchangeably with the night visual system (NAV FLIR) and targeting IR. FLIR on the TSD always refers to the targeting IR. Sensor selection is "HOTASable" in the rear cockpit with the castle switch; it is not "HOTASable" in the front cockpit. HOTAS will be described later in this workbook.

Display Window Size: HRM patch maps are normally commanded from the A/G radar display. However, they can be commanded from the TSD. PB #8 selects and displays the HRM patch map display window. Display window (DW) size is "HOTASable" in both cockpits with the auto acq switch. The sizes available are 1.3, 3.3, 4.7 and 10.0 nm. A 0.67 HRM DW can be selected on the air-to-ground radar display, but not from the TSD. The system does not allow an HRM patch map to be made of the entire display, i.e., to get a map of 10.0 nm square, at least 20 nm range must be displayed on the TSD. The other limitation imposed is that a 1.3 map can only be commanded from 3.4 to 39.33 nm from the aircraft, a 3.3 map from 4.4 to 48.65 nm, and a 4.7 map from 5.2 to 77.65 nm. Within 8° of the nose and outside of 60° from the aircraft ground track, a patch map cannot be made (exclusion zone). An "X" appears in the display window if any of the above limitations exist. HRM patch mapping will be covered in later lessons.

Route: PB #9 displays the route selection. This button can be cycled through routes A, B and C. There is no requirement to have the TSD route match the current INS/MN route. This means the B route could be displayed showing the outline of a MOA or restricted area while the INS/MN is providing steering to a

sequence point on Route A, such as 5A, selected at PB #10 on the UFC Menu 1 or Data 1 display.

BIAS: When selected at PB #10, this feature displays a test frame (Figure D-4) used for symbology alignment over the displayed map.

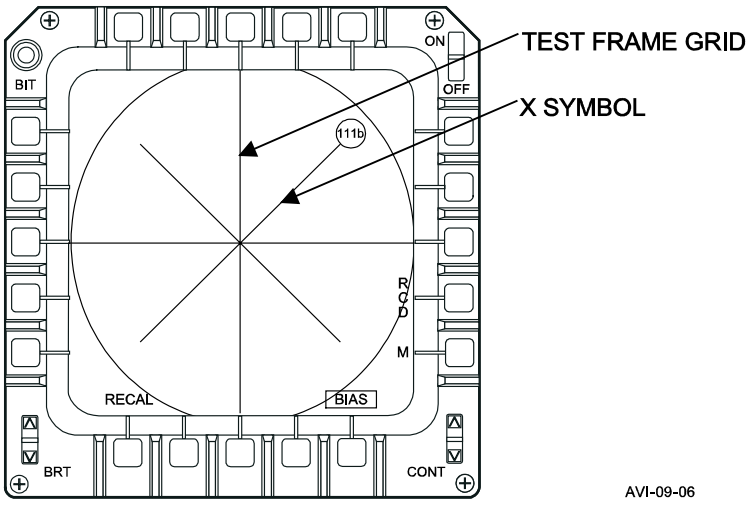


Figure D - 4. BIAS.

After selection, the TDC is used to center the "X" symbol within the test frame video. The X symbol is stationary while the test frame grid + moves by inputs from the TDC. The TSD BIAS should be checked on every flight to ensure aircraft position, sensor cueing, steer point and course line symbology is correctly overlaid on the map.

The code in the upper right quadrant, 111b in Figure D-4, indicates which RMR filmstrip is loaded.

RECAL: Map video calibration can be accomplished by selecting RECAL at PB #6. When boxed, a 60-second cycle begins. TSD routes and overlays are displayed; however, no map will be displayed. RECAL is not normally selected since map calibration is automatic at power up. If the map is not clear, select RECAL to initiate another calibration.

M: PB #11 selects the menu display.

RCD: Pressing PB #12 records the display.

Range Selection: PB #13 and #14 are used to either decrease or increase the display range. Selectable ranges are 10, 20, 40 and 80 nautical miles. Map scale is HOTASable from the RCP using the castle switch.

ZM: This button permits expansion of the map by a factor of 10/7, allowing for greater magnification (about 1-1/2> times) of details. The range tic marks at the left side and bottom also reflect the reduced range. The reduced range is indicated in the range window between PB #13 and #14 (Figure D-5). The resulting zoom ranges are 7, 14, 28 and 56.

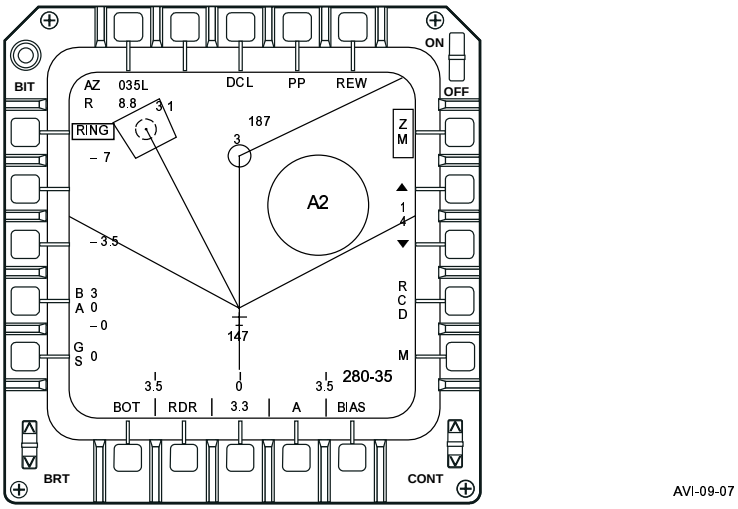


Figure D - 5. Zoom Display.

REW: Selecting PB #16 boxes REW and rewinds the moving map cassette. Rewinding must be accomplished before the film can be removed from the remote map reader. "FILM REWOUND" is displayed when the procedure is complete. Ensure the white dot is visible on the cassette before removing.

PP: The legend below PB #17 normally shows PP (present position). The PP format always displays the aircraft symbol in the BOT or CTR position and displays the selected route steer points in sequence (provided the range displayed is adequate). PB #17 is used to select any point for TSD navigation route look ahead. The first depression, with a blank scratchpad, will display the first point on the route. Each subsequent depression displays the follow-on route points in order. When look ahead is selected, all points are presented in the center of a north-up display, and the selected point number is displayed below PB #17. The range scale may be changed and will remain at the last setting until changed again. Also, the aircraft symbol is removed from the display (Figure D-6). In the look ahead display, the sensor cue range and bearing line will originate from the direction of the aircraft (i.e., the tail points back to the A/C). The look ahead function is "HOTASable" with the FCP coolie and the RCP castle switches. Coolie "up" in FCP or castle switch "down" in RCP selects the look ahead function starting at the first route sequence point.

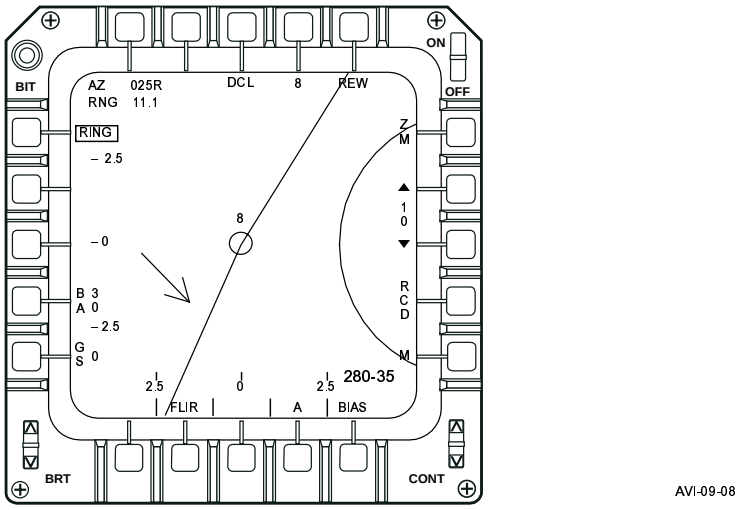


Figure D - 6. Look Ahead Display.

Any look ahead point on the selected route can also be selected directly by typing the desired sequence point number in the scratchpad of the UFC and then pressing PB #17 on the MPD/MPCD. Return to PP can only be done with HOTAS by depressing the auto acq switch in the cockpit in command of the TSD.

If for some reason an invalid sequence point (decimal point error or a point not on the route) is selected with the UFC, "ERROR" appears under PB #17 for 5 seconds (Figure D-7), then the display returns to its previous identification.

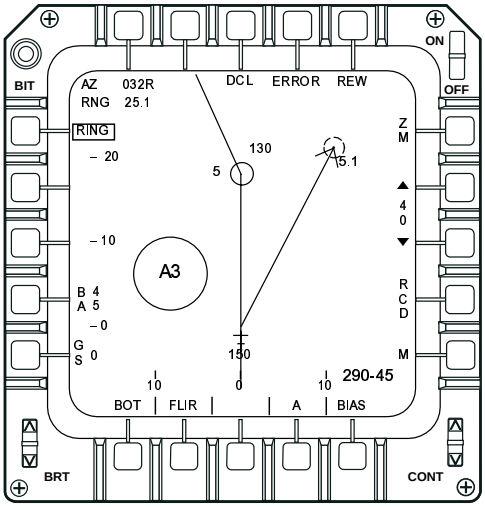


Figure D - 7. Sequence Point Error.

Turn radius is displayed out of each look ahead point, depending on the selections at PB #4 and #5.

DCL: Pressing this button places a box around the option and declutters the display by removing most of the symbology normally displayed. Active radar coverage, FLIR active line-of-sight and sequence point information are removed. The only symbology left on the display is the present position (PP) aircraft symbol, the sensor cue with a range and bearing line, and bullseye range and bearing (Figure D-8). Pressing the button again unboxes DCL and restores those removed items to the display.

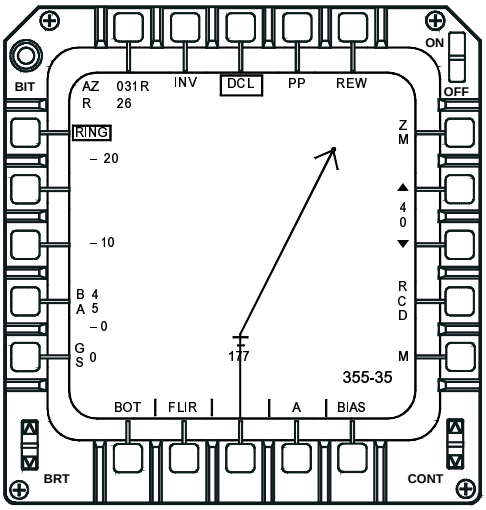


Figure D - 8. Decluttered Screen.

INV: This option permits improved night viewing of the map data when it is on a monochromatic display (MPD). The display format switches from standard video to inverse video, also called reverse video. The effect is similar to viewing a negative image of a photograph. This option is only available on an MPD (unavailable on an MPCD).

Map Display Advisories

FILM REWOUND: This indicates that the film is rewound and ready to be removed (Figure D-9).

VIDEO CALIBRATION: RECAL is in progress.

CASSETTE DOOR OPEN: Film access door in RCP is open.

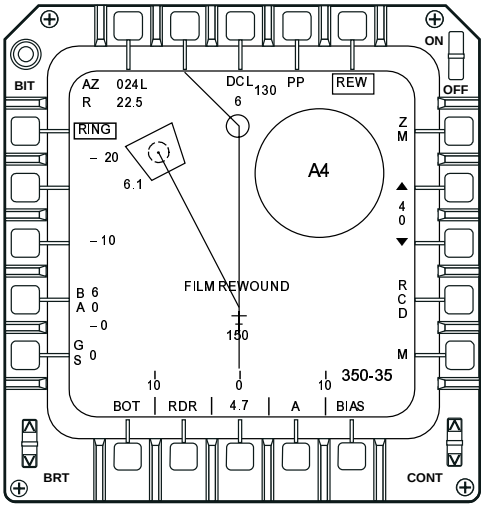


Figure D - 9. Advisories on Display.

SCALE NOT AVAILABLE: This indicates that there is no chart of the scale requested in the RMR.

MAP NOT AVAILABLE: If there is no filmstrip (of any scale) for the commanded position, this message is displayed.

INVALID PP: This message is displayed when the present position data is invalid. In addition, the map is frozen at the last valid position known to the central computer.

Primary Designated Target (PDT): Figure D-10. This symbol (in red on a MPCD) represents an aircraft being tracked by the A/A radar. It is positioned at the actual range and bearing and its orientation depicts its approximate relative heading. To have this information available for display, the radar must be in an A/A track mode.

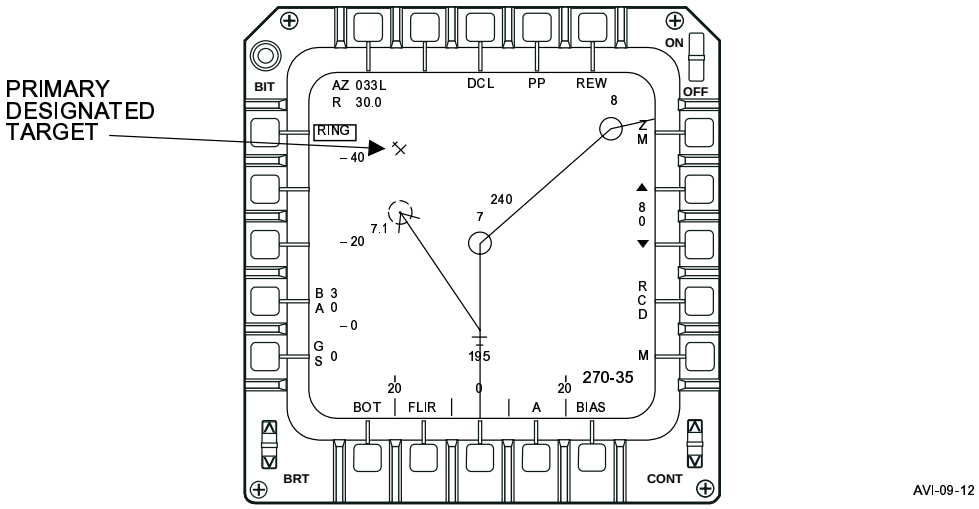


Figure D - 10. Priority Designated Target.

QUESTIONS

1. The maximum range displayed in front of the aircraft on the TSD is

   a. 120 nm.
   b. 80 nm.
   c. 60 nm.
   d. 40 nm.

2. Selecting ZM

   a. expands the map displayed.
   b. speeds to the next steer point.
   c. examines the next aim point.
   d. examines the next steer point.

3. The declutter option (DCL) eliminates every symbol from the TSD except

   a. steer point and aircraft position information.
   b. steer points.
   c. the aircraft symbol.
   d. the aircraft symbol, sensor cue with a range and bearing line, and bullseye range and bearing.

4. An additional aircraft symbol present on the TSD represents

   a. your projected aircraft position.
   b. a target (PDT) being tracked by the A/A radar.
   c. an airfield target.
   d. your wingman's position.

5. The CTR option

   a. places the next steer point at the center of a 10 nm, north-up display.
   b. places the aircraft symbol in the center of the display.
   c. is a method of tying in the TEWS with the TSD and displaying both on the same scope.
   d. displays a 100 nm area around the aircraft with all threats and targets.

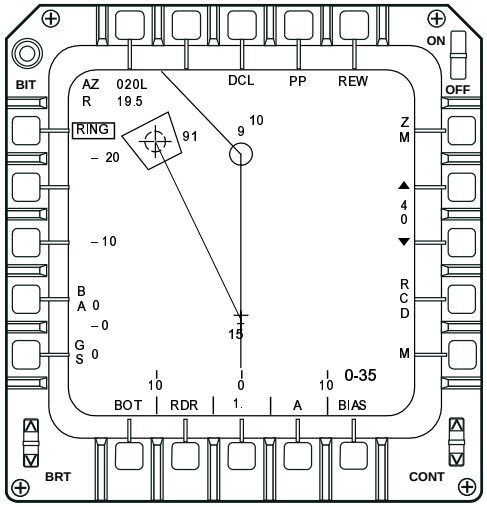


Figure D - 11.

6. Using the display above, what does the crosshair symbol indicate?

   a. Current HRM patch mapping position
   b. Mark point
   c. HRM cue
   d. Aim point

7. The numbers below the present position aircraft symbol on the TSD represent

   a. magnetic heading.
   b. magnetic ground track.
   c. true heading.
   d. true ground track.

ANSWERS

1. c
2. a
3. d
4. b
5. b
6. a
7. b

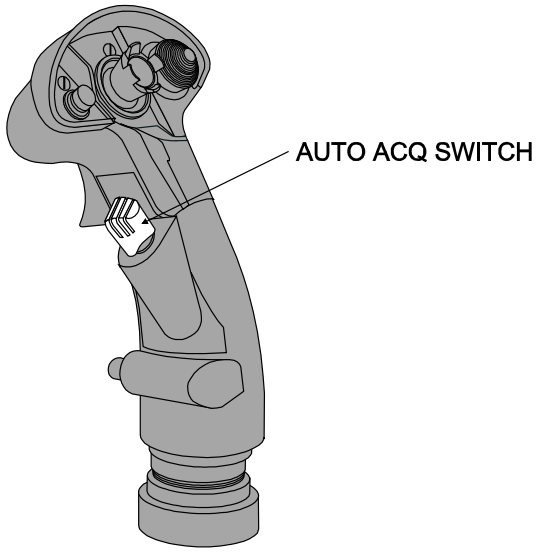
HOTAS Controls

In addition to the controls around the MPD/MPCD, there are several controls located on the FCP stick and throttles as well as the RCP hand controllers.

FCP Stick

The auto acquisition switch (Figure D-12) is the only stick-mounted HOTAS control for the TSD. It controls the HRM display window (radar footprint) size. Moving the switch forward reduces the size and moving it aft increases the size. The size of the footprint determines the size of the HRM patch map when commanded.

Depressing the auto acq switch returns the TSD to a present position format from a look ahead format.



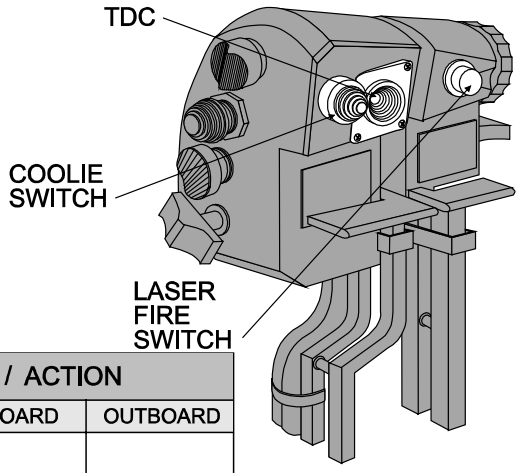
SWITCH	SWITCH POSITION / ACTION			
AUTO ACQ	FORWARD	AFT	DOWN	RELEASE
	SMALLER CUE FOOTPRINT	LARGER CUE FOOTPRINT	RETURN TO P. P. MAP	

AVI-09-14

Figure D - 12. FCP Stick Switchology.

FCP Throttle

The FCP throttles have three different TSD controls (Figure D-13).



SWITCH	SWITCH POSITION / ACTION			
	UP	DOWN	INBOARD	OUTBOARD
COOLIE	LOOK AHEAD (QUICK STEP)			
	TRANSDUCER	DEPRESS	RELEASE	
TDC	RANGE / BEARING LINE CONTROL		HAND-OFF (COMMAND HRM PATCH MAP OR CUE TGT IR)	
LASER FIRE	DEPRESS & RELEASE			
	CUE TRACK / UNTRACK			

AVI-09-15

Figure D - 13. FCP Throttle Switchology.

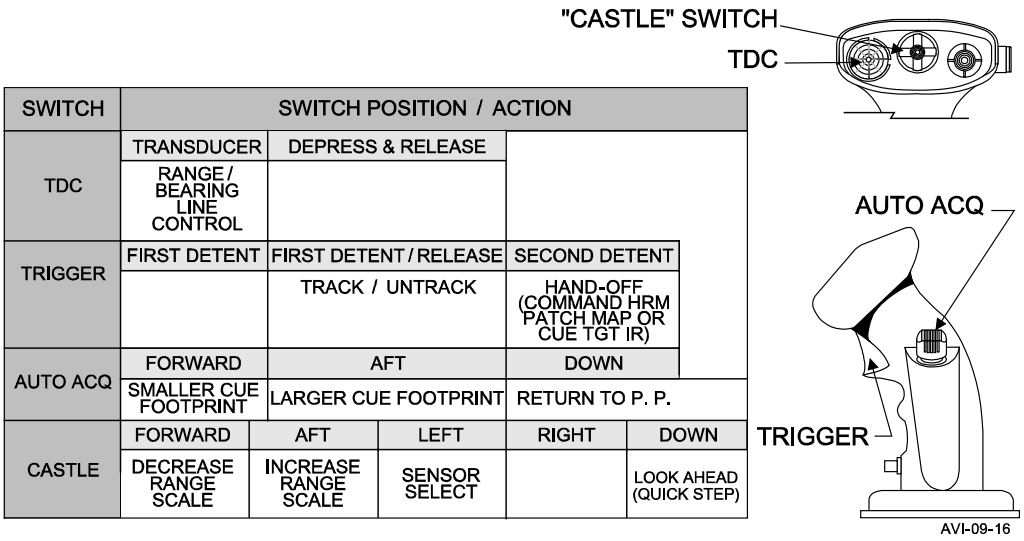
Coolie Switch: The coolie switch is a four position switch located on the inboard front corner of the right throttle. Only one switch position is used for the TSD. Moving the coolie switch up (quick step) steps to the first sequence point (look ahead format).

TDC: Just outboard of the coolie switch is the TDC. It slews the sensor cue at the end of a range and bearing line. Pressure on the TDC moves the cue left, right, out (up on the display), or in (down on the display). When the TDC is pressed and released, it commands the sensor (radar/TGT IR) to slew to the point defined by the sensor cue (hand-off).

Laser Fire Switch: This switch is outboard of the TDC, on the left Throttle. Pressing and releasing the switch alternately commands point track/untrack depending on the state (track/untrack) of the sensor cue when the switch is pressed.

RCP Hand Controller

There are 4 different TSD HOTAS controls on the hand controller (Figure D-14).



SWITCH	SWITCH POSITION / ACTION				
TDC	TRANSDUCER	DEPRESS & RELEASE			
	RANGE / BEARING LINE CONTROL				
TRIGGER	FIRST DETENT	FIRST DETENT / RELEASE		SECOND DETENT	
		TRACK / UNTRACK		HAND-OFF (COMMAND HRM PATCH MAP OR CUE TGT IR)	
AUTO ACQ	FORWARD	AFT		DOWN	
	SMALLER CUE FOOTPRINT	LARGER CUE FOOTPRINT		RETURN TO P. P.	
CASTLE	FORWARD	AFT	LEFT	RIGHT	DOWN
	DECREASE RANGE SCALE	INCREASE RANGE SCALE	SENSOR SELECT		LOOK AHEAD (QUICK STEP)

Figure D - 14. Hand Controller Switchology.

TDC: This switch works like the FCP throttle TDC switch. It slews the sensor cue; it does not, however, hand-off.

Trigger: This switch works like the FCP throttle laser fire switch; at the first detent, it commands TSD sensor cue point tracking. It also works like the front TDC; at the second detent, it commands hand-off of the sensor. Depending on the sensor selection on the TSD, hand-off means the TGT IR slaves to the cue position or the A/G radar starts patch mapping at the cue position.

Auto Acq Switch: This three position switch works exactly like the FCP auto acq switch for TSD. Forward commands a smaller DW size. Aft commands a larger DW size. Depress (down) commands return from a look ahead display to a present position display.

Castle Switch: Pushing down on the castle switch (quick step) selects look ahead to the first sequence point, just as the coolie switch on the FCP throttle does. Moving the castle switch forward decreases the map range scale and moving it aft increases the map range scale. Moving the castle switch to the left toggles between the radar and the targeting IR sensor cue. The front cockpit has no HOTAS control for changing from one sensor to the other.

Remote Map Reader (RMR)

Location

The remote map reader is located in the rear cockpit, on the right console (Figure D-15).

Type Film

The RMR generates a color moving map video signal from aeronautical chart data reproduced on 35mm filmstrips. Currently, there is film for virtually all continental U.S. locations. (The film cassette is loaded and can be changed in flight). One cassette covers a geographic area large enough for almost any mission (e.g., Seymour Johnson to the west coast on a single cassette).

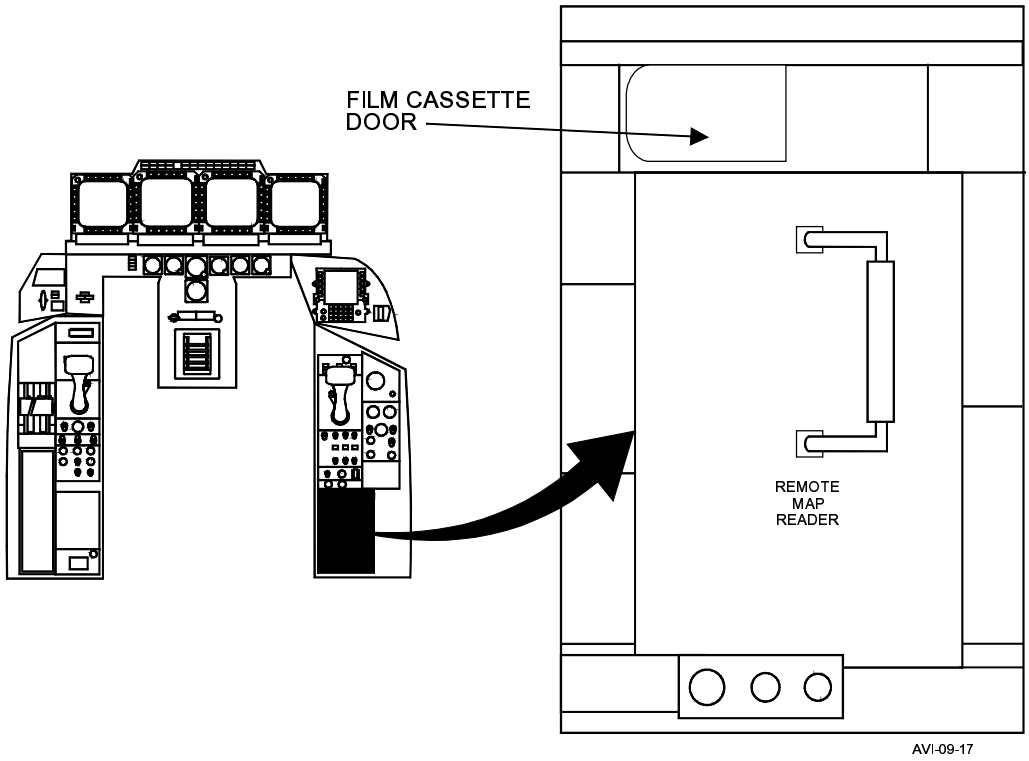


Figure D - 15. Remote Map Reader.

Scale

The scale of the map displayed on the TSD is dependent on the range scale selected by the crew.

- For 80 nm display, the RMR uses a JNC or, 1:2,000,000 scale.
- For 40 nm display, the RMR uses a ONC or, 1:1,000,000 scale.
- For 20 nm display, the RMR uses a TPC or, 1:500,000 scale.
- For 10 nm display, the RMR uses a JOG or, 1:250,000 scale.

INTERFACES

Radar

High Resolution Map

In the discussion so far, all references to A/G radar hand-off have meant the high resolution map (HRM) patch mapping mode. This very high quality ground mapping operation can produce resolutions as fine as 8.5 feet on patch maps constructed from as far away as 39.33 nm.

The high resolution map can be interfaced through the TSD to make a "patch map" of a specific area.

Real Beam Map

The RBM scan pattern is displayed on the TSD screen either as a wedge or baseball home plate shape originating from the aircraft present position.

If less than a full sweep is selected at PB #9 (on the A/G radar display), the scan pattern will appear on the TSD as a "V" centered on the A/G radar cursor.

When RBM is deselected on the A/G radar display, the wedge, baseball home plate or "V" shape will remain displayed on the TSD at the last position displayed.

Targeting IR

The targeting IR is a weapons delivery related system. This system can be cued from the TSD to a line of sight for a specific geographic coordinate location (viewed on the TSD map).

Upfront Control

The upfront control interacts with the TSD by enabling the crew members to directly select look ahead points. By typing a point identification on the scratchpad, and then pushing PB #17 on the TSD, that point will appear centered on the TSD in a north-up format.

Inertial Navigation System (INS) / Embedded GPS/INS (EGI)

The INS or EGI provides aircraft attitude, heading, velocity and acceleration information to (among other systems) the CC. With INS selected as the present position source, the CC uses INS data to place the aircraft symbol (INS present position) and sequence points on the TSD. With EGI as the present position keeping source, the CC uses EGI data to place the aircraft position and sequence points. The CC also uses INS/EGI data to cue the A/G radar/targeting IR to the position selected on the TSD (radar display window cue, targeting IR cue). Once the sensor is cued, the sensor position is maintained by the CC using MN data, if INS is the PPKS or EGI data if EGI is the PPKS.

Mission Navigator (MN)

The mission navigator is the central computer routine that maintains aircraft present position independent of the INS or EGI. With MN selected as the present position source, the CC uses MN data to place the TSD symbology.

TSD Format With CC Failure

With CC failure the TSD/RMR format (Figure D-16) loses target and cursor related functions. It continues to provide all primary status cues. Two selectable parameters remain: map scale selection and INS position update. With CC failure, the INS can be updated by first calling up the UFC point data submenu and entering the new point and its lat/long. Then overfly the point and press PB #16 (O/F UPDT) on the TSD display to accomplish the update. This procedure updates the INS directly (no Kalmann filtering), so exercise caution when using it.

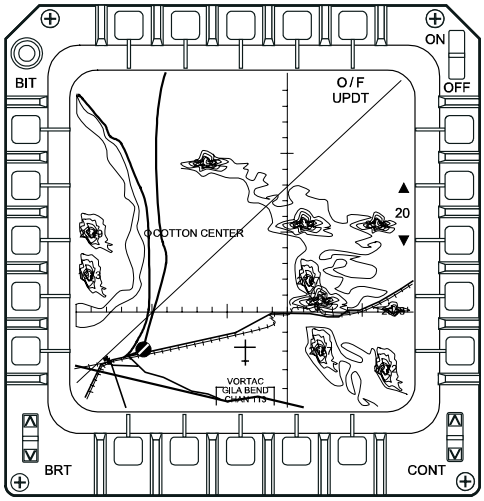


Figure D - 16. TSD Format With CC Failure.

QUESTIONS

1. (FCP) Which controls on the TSD are "HOTASable"?

   a. Sensor selection
   b. Display window size selection
   c. Range selection
   d. Both a and b

2. (RCP) Which controls on the TSD are "HOTASable"?

   a. Sensor selection
   b. Display window size selection
   c. Range selection
   d. All of the above

3. Sensor cue point track commanding is accomplished with the _____ in the FCP, and the _____ in the RCP.

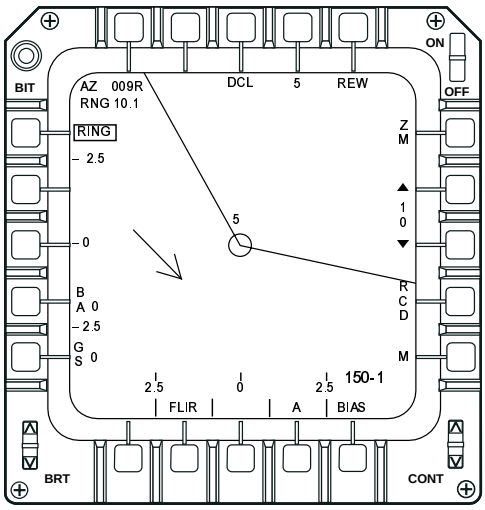


Figure D - 17.

4. What would the result be, on the TSD above, if you pushed the auto acq switch down on the FCP stick/RCP hand controller?

   a. Nothing.
   b. Return to a present position format, 20 mile range.
   c. Return to a present position format.
   d. Enlarge the HRM cue.

5. (FCP) The TDC is used to

   a. slew the sensor cue.
   b. command sensor handoff.
   c. bias the TSD map after selecting BIAS at PB #10.
   d. All the above.

6. (RCP) The TDC is used to

   a. slew the sensor cue.
   b. bias the TSD after selecting BIAS at PB #10.
   c. command sensor handoff.
   d. a and b.
   e. All the above.

7. (FCP) The castle switch is a 5 position switch that, among other things

   a. commands point track of the INS.
   b. commands point track of the sensor.
   c. steps to the next sequence point.
   d. None of the above.

8. (RCP) The castle switch is a 5 position switch that, among other things

   a. commands point track of the INS.
   b. commands point track of the sensor.
   c. selects look ahead.
   d. None of the above.

ANSWERS

1. b

2. d

3. laser fire button, trigger half action

4. c

5. d

6. d

7. d

8. c

GLOSSARY

A/G	Air-to-ground
A/A	Air-to-air
BA	Bank angle
BE	Bullseye
DCL	Declutter
DMS	Digital map system
DTM	Data transfer module
DW	Display window
EGI	Embedded GPS/INS
FLIR	Forward looking infrared
GPS	Global positioning system
GS	Groundspeed
HOTAS	Hands on throttle and stick
HRM	High resolution map
INS	Inertial navigation system
IP	Initial point
MN	Mission navigator
MPD	Multipurpose display
PP	Present position
PPKS	Present position keeping source
RBL	Range and bearing line

RBM Real beam map
RMR Remote map reader

TSD Tactical situation display